



OPERATOR'S MANUAL
RSS-2000
ELECTRIC VEHICLE BARRIER



RSSI BARRIERS LLC.
6530 East Highway 22
Panama City, Florida 32404
850-871-9300/Fax 850-871-4300
Web Site: www.rssi.com

14 FEBRUARY 2011

Table of Contents

| | | |
|----------|---|-----------|
| 1 | GENERAL | 3 |
| 1.1 | PURPOSE | 3 |
| 1.2 | NEXT GENERATION SERVO EM TECHNOLOGY | 3 |
| | <i>Figure 1-1, MPAI-Series Cutaway</i> | 3 |
| 1.3 | LIMITED WARRANTY | 4 |
| 1.4 | SAFETY SUMMARY | 5 |
| 1.4.1 | <i>General Safety Instructions</i> | 5 |
| 1.4.2 | <i>Safety Instructions</i> | 5 |
| 1.5 | OPERATOR RESPONSIBILITIES | 6 |
| 2 | SPECIFICATIONS | 6 |
| 2.1 | GENERAL SPECIFICATIONS | 6 |
| | <i>Figure 2-1, RSS-2000VI Electric Wedge Vehicle Barrier (pictured)</i> | 6 |
| 2.2 | OPERATING SYSTEM SPECIFICATIONS (TYPICAL) | 6 |
| 2.3 | SAFETY FEATURES | 7 |
| 3 | OPERATING PROCEDURES | 7 |
| 3.1.1 | <i>Operator Push Button Consoles</i> | 7 |
| | <i>Figure 3-1, Push Button Console</i> | 7 |
| 3.1.2 | <i>Manual Operation</i> | 7 |
| | <i>Figure 3-2, Remove Access Plates</i> | 8 |
| | <i>Figure 3-3, Bollard Openings</i> | 8 |
| | <i>Figure 3-4, Manual Brake Overdrive</i> | 9 |
| | <i>Figure 3-5, Remove Access Plates</i> | 9 |
| | <i>Figure 3-6, Bollard Openings</i> | 10 |
| | <i>Figure 3-7, Manual Brake Overdrive</i> | 10 |
| 4 | OPERATOR MAINTENANCE | 11 |
| 4.1 | RECOMMENDED PREVENTIVE MAINTENANCE INSPECTIONS | 11 |
| | <i>Table 4-1, Recommended Preventive Maintenance Inspections</i> | 11 |
| | ATTACHMENT 1 – QUARTERLY MAINTENANCE CHECKLIST | 12 |
| | ATTACHMENT 2 – SUPPORT POST | 17 |



1 GENERAL

The RSS-2000 is an all-electric wedge-type vehicle barrier that is K-12 certified by the Department of State (tested to stop a 15,000 lb. vehicle traveling at 50 MPH). The RSS-2000's normal operating speed is less than 3 seconds regardless of temperature (-40 degrees F to +200 degrees F). The RSS-2000 has a diamond plate anti-skid drive surface that flush mounts with the roadway. All barrier systems are fully tested, operational, and ready to install when shipped from the factory. The simple design of the RSS-2000 requires almost no maintenance even in high traffic applications.

1.1 Purpose

This manual provides basic information on the operation and preventative maintenance of the RSS-2000 Electric Wedge Vehicle Barrier and is designed to assist DOS Owner/User Personnel.

1.2 NEXT GENERATION SERVO EM TECHNOLOGY

The MPAI-Series Servo Actuator designed by Allan Bradley for RSSI products represents a leap ahead in electric motor technology. It uses roller screw technology, which has 15 times the travel life of an equivalent size ball screw. The MPAI-Series actuator functions in the same manner as a brushless servomotor. The servo drive rotates the motor at controlled speeds and torque, for a controlled number of revolutions and move times. This rotary motion translates into linear motion by use of the internal planetary roller screw mechanism of the MPAI-Series actuator.

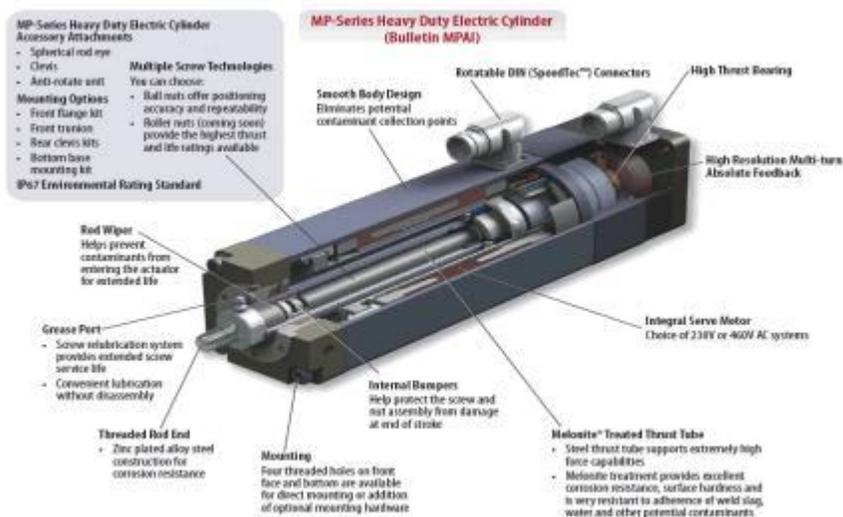


Figure 1-1, MPAI-Series Cutaway

All actuators have IP-67 DIN Connectors (water resistant) and a manual overdrive for the brake that allows for the manual operation of the barrier UP or DOWN using a cordless drill with the proper attachment. The MPAI-Series actuator incorporates an absolute encoder as the primary rotary feedback device. If power is lost the barrier retains its position so as power is restored; no “homing” or “calibration” is required. The MPAI-Series Servo Actuator has an internal holding brake. Whenever there is not power to the brake, the armature is held in place preventing the inverted roller screw from turning and prevents the output rod from back driving, which in turn prevents the output rod from moving.

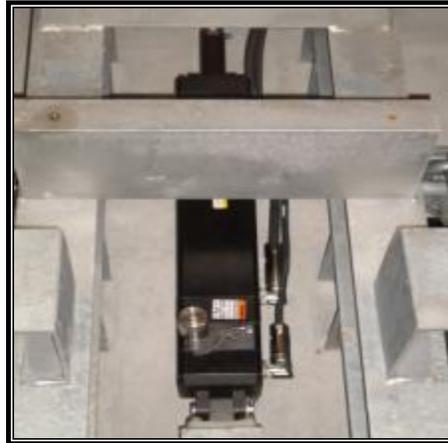


Figure 1-2, MPAI Series Servo Actuator in RSS-2000 Barrier

1.3 Limited Warranty

Robotic Security Systems, Inc. warrants the RSS-2000 Series of Barriers (RSS-2000, RSS-2000V, RSS-2000VI) to be free of defects in workmanship and materials for a period of **3 years for electrical and 5 years for mechanical components – PARTS ONLY**. Warranty will begin from the date of shipment from the factory or if installed by Robotic Security Systems, Inc., from the date of installation unless otherwise noted on the bottom of this form.

Robotic Security Systems, Inc. reserves the right of final determination as to the existence and causes of any defect or failure. Any part or parts found to be defective and that are returned to Robotic Security Systems, Inc. within the warranty period, shall at our option be repaired or replaced free of charge F.O.B. the factory.

The warranty will not apply to the following circumstances that are beyond our control. Misuse, vandalism, accident, neglect, unauthorized repairs or modifications, acts of God (lightning, floods, insect damage, etc...), power surges, incorrect installation, or application.

The warranty set forth above is entirely exclusive and no other warranty whether written or oral, is expressed or implied. Robotic Security Systems, Inc. specifically disclaims any and all implied warranties, merchantability or fitness for a particular purpose. It is the purchaser's sole and exclusive responsibility to determine whether or not the equipment will be suitable for a particular purpose. In no event shall Robotic Security Systems, Inc. be held liable for direct, indirect, incidental, special, consequential damages or loss of profits whether based on contract, tort, or any other legal theory during the course of the warranty or at any time thereafter. The end user agrees to assume all responsibility for all liability involving the use of this product, releasing Robotic Security Systems, Inc. of all liability.

All RSSI barriers require minimal maintenance; however, there are some tasks that need to be performed after the barrier is installed to insure compliance with the warranty provided. When the RSSI barrier is installed and not accepted by the end user until a later date, the quarterly preventive maintenance tasks located in Attachment 1 of the Operator's Manual must be accomplished until acceptance by the end user. Likewise, after acceptance the end user is required to conduct these quarterly preventive maintenance tasks to ensure the warranty is valid.

IN ORDER TO USE THE VEHICLE BARRIER, YOU MUST UNDERSTAND AND BE IN FULL UNCONDITIONAL AGREEMENT WITH ALL STIPULATIONS OUTLINED ABOVE. IF YOU ARE



NOT IN FULL AGREEMENT, DO NOT PUT UNIT INTO OPERATION. PLACING THE VEHICLE BARRIER INTO OPERATION WILL BE CONFIRMATION THAT YOU ARE IN FULL UNCONDITIONAL AGREEMENT WITH ALL OF THE ABOVE.

1.4 Safety Summary

1.4.1 General Safety Instructions

This manual describes physical operation and maintenance procedures. Please NOTE the procedures may cause injury or death to personnel, or damage to equipment if NOT properly followed. Prior to performing any task, the WARNINGS, CAUTIONS, and NOTES included in that task shall be reviewed and understood.

1.4.1.1 Warnings, Cautions and Notes

WARNINGS and CAUTIONS are used in this manual to highlight operating or maintenance procedures, practices, conditions or statements that are considered essential to protection of personnel (WARNING) or equipment (CAUTION). WARNINGS and CAUTIONS immediately precede the step or procedure to which they apply. WARNINGS and CAUTIONS consist of three parts: heading (WARNING, CAUTION, or NOTE); a statement of the hazard; minimum precautions and possible result if disregarded. NOTES are used in this manual to highlight operating or maintenance procedures, practices, conditions or statements that are not essential to protection of personnel or equipment. NOTES may precede or follow the step or procedure, depending upon the information to which it pertains. The headings used and their definitions are as follows.

WARNING

HIGHLIGHTS AN ESSENTIAL OPERATING OR MAINTENANCE PROCEDURE, PRACTICE, CONDITION, STATEMENT, ETC. WHICH IF NOT STRICTLY OBSERVED, COULD RESULT IN INJURY TO, OR DEATH OF, PERSONNEL OR LONG TERM HEALTH HAZARDS.

CAUTION

HIGHLIGHTS AN ESSENTIAL OPERATING OR MAINTENANCE PROCEDURE, PRACTICE, CONDITION, STATEMENT, ETC, WHICH, IF NOT STRICTLY OBSERVED, COULD RESULT IN DAMAGE TO, OR DESTRUCTION OF, EQUIPMENT OR LOSS OF MISSION EFFECTIVENESS.

NOTE

HIGHLIGHTS AN ESSENTIAL OPERATING OR MAINTENANCE PROCEDURE, CONDITION, OR STATEMENT.

1.4.2 Safety Instructions

Operators of the RSS-2000 vehicle barrier **MUST** comply with the following important safety instructions **PRIOR TO** and **DURING** the operation of the RSS-2000 vehicle barrier.

NOTE

- Read and comply with all safety rules in this manual before operating the barrier.

CAUTION

- A fully trained maintenance person must perform all maintenance work.
- In the case of an unmanned gate operation, vehicles must remain clear of the barrier during the raising and lowering of the Barrier Post Assembly. Be sure to post signs warning of the barrier operation.



| |
|----------------|
| WARNING |
|----------------|

- If this unit is placed in a main traffic area, place traffic safety cones and make every attempt to divert or stop traffic before maintenance is started.
- Do not put any objects into openings and keep all obstructions clear of the vicinity of the barrier
- Do not operate this equipment when you are distracted or under the influence of drugs, alcohol or medication causing diminished control.
- Prior to accessing the RSS-2000 cover plates, all electrical connections to the barrier will be isolated (disconnected).
- Use special care when removing any inspection plates as these plates are very heavy.
- Never operate this equipment when a vehicle, person or any obstruction is in the way of full operation of the RSS-2000.

1.5 Operator Responsibilities

The owner/user of the RSS-2000 should be aware that they must:

- Not operate the vehicle barrier without receiving prior certification training, including reading this Operator Manual.
- Follow all safety rules, warnings and caution statements outlined in this Operator Manual.
- Retain a copy of this Operator Manual with the vehicle barrier controls.
- Prominently display warning signs on both sides of the vehicle barrier.
- Always be certain that the barrier area is clear of vehicles before operation.
- Discontinue use if the vehicle barrier fails to operate properly.
- Contact a trained barrier maintenance technician to maintain and repair the barrier.

2 SPECIFICATIONS

2.1 General Specifications

- All barriers consist of a shallow steel vault assembly that is hot dip galvanized with a diamond plate anti-skid top surface and a removable post assembly.
- The removable post assembly height is 35 to 36 inches at deployment.
- Certified by the Department of State K-12 with zero penetration (K-12 - 50 MPH all @ 15,000 lbs) K-12 certification equates to 1,250,000 lbs of energy absorption.



Figure 2-1, RSS-2000VI Electric Wedge Vehicle Barrier (pictured)

2.2 Operating System Specifications (Typical)

- The barrier is operated by a Servo MP Series Heavy Duty Electric Cylinder and a Spring Assist Assembly.
- Main Power – The Servo Drive System operates on 220V 50 Hz single-phase power.



- Loss of Commercial Power Operation – An optional Battery Back-up System can provide over 200 continuous cycles in the event of primary power loss. Control of the barrier is accomplished through normal operating controls.
- Manual Operation – Barriers can be manually operated with a cordless drill fitted with the proper drive.
- Controls - The following circuits and controls shall be furnished.
- EPU/Control Panel - A control panel shall be provided to interface between all operator consoles and barrier locations. This control panel shall contain all control circuits necessary for barrier operation.
- Construction - The control panel shall be mounted in a general-purpose NEMA 4 metal enclosure. All device interconnect lines shall be run to terminal strips.
- Operator Console – Barrier is supplied with a push button operator console capable of controlling one barrier.

2.3 Safety Features

- Each unit is equipped with two safety LED lights mounted on the outside posts.
- Reflective red and white striped material is placed along the crash bar on both the approach and backsides.
- Barrier post assembly is painted traffic safety yellow standard.

3 OPERATING PROCEDURES

3.1.1 Operator Push Button Consoles.

- Push Button Operator Console



Figure 3-1, Push Button Console

- **Normal Operation**
 - Press the “UP” button to raise the barrier (“ARM” the barrier) to close traffic.
 - Press the “DOWN” button to lower the barrier (“CLOSE” the barrier) to allow traffic to pass.
 - Any situation that requires stopping the movement of the barrier either in the UP or DOWN motion, press the opposite button. This will cause the barrier to stop and reverse direction.

3.1.2 Manual Operation

3.1.2.1 Manually Lower Barrier

- Make sure the power is turned off to the Vehicle Barrier.
- Place necessary traffic safety cones to help insure worker safety.

WARNING

Use special care when removing any inspection plates as these plates are heavy and if mishandled can cause bodily injury.

- Using a cordless drill with a T-45 Torx Head bit, remove the bolts from the middle access plate (large one). After all bolts are removed, remove the access plate from the barrier.

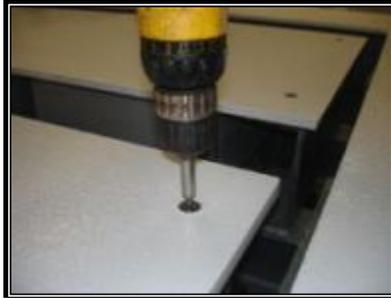


Figure 3-2, Remove Access Plates

WARNING

Never place any body parts in the vicinity of the bollard openings! Position yourself at the back of the barrier (non-threat side) when attempting to manually lower the barrier.



Figure 3-3, Bollard Openings

- Tools needed; a 1 inch socket (provided by RSSI), a ratchet with extension, and cordless drill.
- Using the socket and ratchet wrench, place the socket on the 1 inch nut and depress the spring loaded mechanism. Turn the ratchet clockwise while applying approximately 30 lbs downward pressure to align the gears.
- Then switch to a cordless drill and set the drill on the slowest RPM setting.
- Set the drill to forward, depress the manual socket drive by pressing on back of drill applying approximately 30 lbs downward pressure.
- Lower the barrier by keeping firm pressure on the drill and operating it forward on the slowest RPM setting until it reaches the fully down position.

WARNING

**FAILURE TO FOLLOW THESE PROCEDURES
COULD SEVERELY DAMAGE THE BRAKE
OVERDRIVE AND INVALIDATE THE WARRANTY**



Figure 3-4, Manual Brake Overdrive

- Replace the Access Cover and bolts, remove traffic safety cones, and contact site supervisor.

3.1.2.2 Manually Raise Barrier

- Make sure the power is turned off to the Vehicle Barrier.
- Place necessary traffic safety cones to help insure worker safety.

CAUTION

Use special care when removing any inspection plates as these plates are very heavy and can cause bodily injury.

- Using a cordless drill with a T-45 Torx Head bit, remove the bolts from the middle access plate (large one). After all bolts are removed, remove the access plate from the barrier.

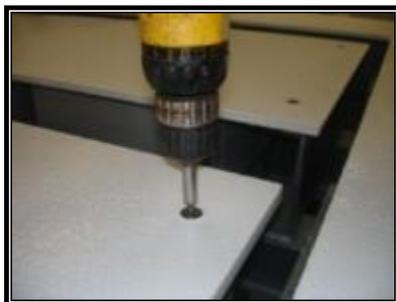


Figure 3-5, Remove Access Plates

WARNING

Never place any body parts in the vicinity of the bollard openings. Position yourself at the back of the barrier (non-threat side, see picture below) when attempting to manually raise the barrier.



Figure 3-6, Bollard Openings

- Tools needed; a 1 inch socket (provided by RSSI), a ratchet, and cordless drill.
- Using the socket and ratchet wrench, place the socket on the 1 inch nut and depress the spring loaded mechanism. Turn the ratchet counter clockwise **while applying approximately 30 lbs downward pressure to align the gears.**
- Then switch to a cordless drill and set the drill on the slowest RPM setting.
- Set the drill to reverse, depress the manual socket drive by pressing on back of drill **applying approximately 30 lbs downward pressure.**
- Raise the barrier by keeping firm pressure on the drill and operating it reverse on the **slowest RPM** setting until it reaches the fully down position.

WARNING

FAILURE TO FOLLOW THESE PROCEDURES COULD SEVERELY DAMAGE THE BRAKE OVERDRIVE AND INVALIDATE THE WARRANTY

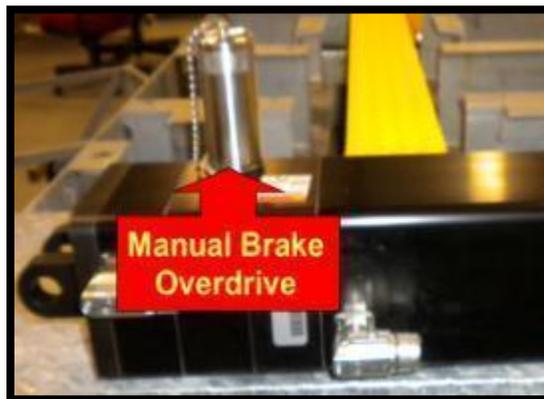


Figure 3-7, Manual Brake Overdrive

- Replace the Access Cover and bolts, remove traffic safety cones, and contact site supervisor of problem.

4 OPERATOR MAINTENANCE

The simple design of the RSS-2000 requires almost no maintenance. If your RSS-2000 vehicle barrier system needs repair or maintenance at any time, please contact your site supervisor. Robotic Security Systems, Inc. Technical Service contact numbers: Toll Free (866) 249-1029 or (850) 871-9300

4.1 Recommended Preventive Maintenance Inspections

| DAILY | BI-WEEKLY | MONTHLY | QUARTERLY |
|--|---|---|--|
| Conduct a function check of the barrier to verify it is functioning properly. Once each shift or daily is preferred for Final Denial (Normally DOWN barriers). | Visually inspect inside of barrier vault to determine no debris has built up inside. Remove any built-up debris | Check all painted parts and touch up as needed. | Conduct IAW Preventive Maintenance Checklist at Attachment 1 of this manual. |
| Visually inspect LED Safety lights on the post assembly for functionality. | Visually inspect inside of barrier vault to determine no water has built up inside. Remove any debris around sump pump. | | |
| Inspect barrier access plate screws to ensure all are tight. Replace or tighten if necessary. | | | |

Table 4-1, Recommended Preventive Maintenance Inspections



Attachment 1 – Quarterly Maintenance Checklist

Make copies of this checklist for maintenance activity for each barrier and maintain a copy in the maintenance binder for the Warranty/Historical Record.

| | |
|--|---|
| Location: | Unit Model #:RSS-2000 |
| Unit Serial #: | Voltage: 120/240 V Single Phase, 30 Amp |
| Barrier Cycle Count: | Date of Maintenance: |
| Name of Person Performing Maintenance: | |

1. Turn power on to unit (if necessary) to check for proper voltage.
2. Place necessary traffic safety cones to insure worker safety.
3. Check operation of unit. Operate 3 times. Ensure that the post assembly operates smoothly (less than 3 seconds) and the barrier rises to the fully UP position and the barrier lowers to the fully DOWN position flush with barrier top access plates.
4. Check LED Safety Lights on barrier for proper operation.
5. Check sump pump and drainage ports (if applicable). Make sure that the drain ports and/or sump pump are clear of debris and the sump pump operates properly. Check sump pump cycle (automatically turns on every 2-3 minutes and shuts off if dry)



6. Make sure the Vehicle Barrier is in the open (UP) position and power is turned off.

CAUTION

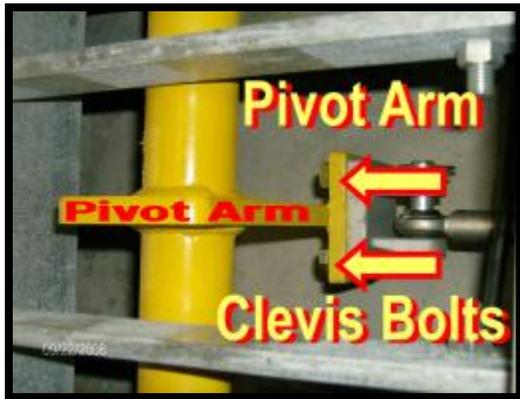
If barrier will be worked on while in UP position, insert support post to prevent barrier from being inadvertently lowered during maintenance.



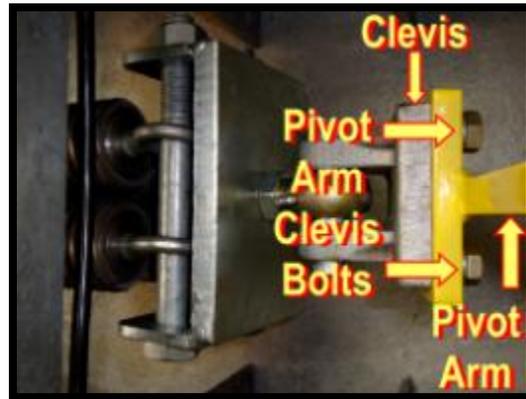
- 7. Remove Access Plates. Using a cordless drill with a T-45 TORX Head Bit, remove the screws from the middle access plate (large one). After all screws are removed move the access plate from the barrier.



- 8. Check Actuator & Spring Assembly Pivot Arm Clevis Bracket Bolts. If these connections are not kept tight, it might cause loose motion that could result in excessive wear.

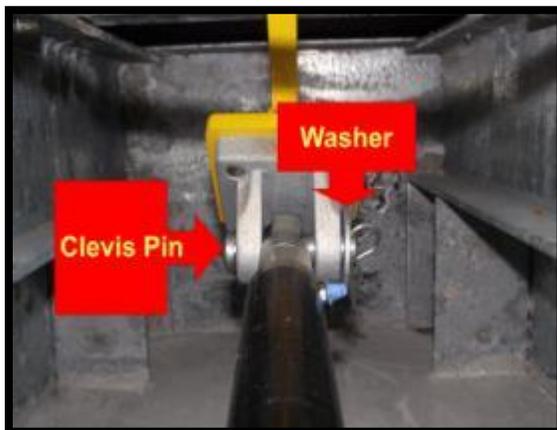


Actuator Pivot Arm



Spring Assembly Pivot Arm

- 9. Check Actuator Clevis bolt and nut. Make sure these are tight. A loose fit might cause excessive wear and improper barrier operation.

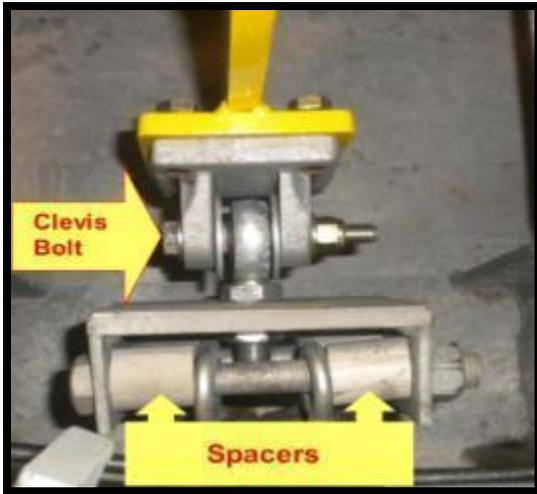


PIVOT TUBE END

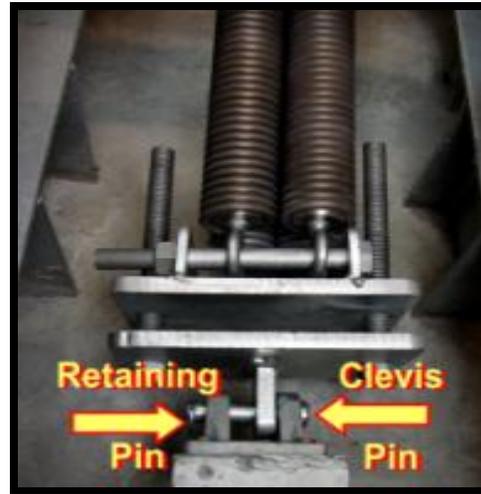


MOTOR END

10. Check Spring Assembly Front Clevis Pin & Retaining Pin and Pivot Tube end Bolt and Nut. Make sure these are tight. A loose fit might cause excessive wear and improper barrier operation.

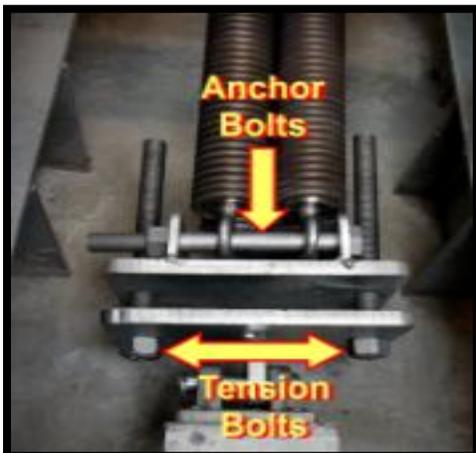


PIVOT TUBE END

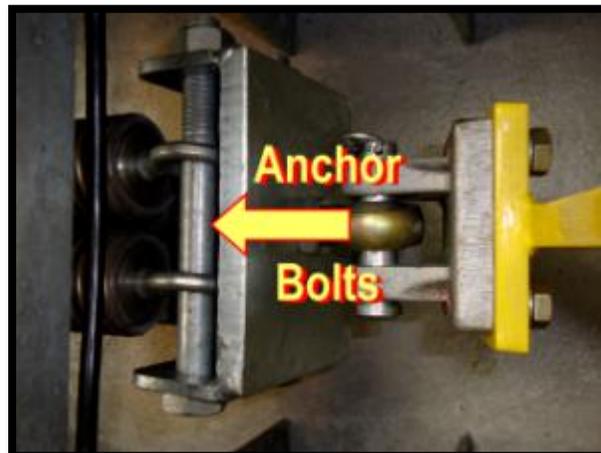


FRONT END

11. Check Spring Assembly. Make sure springs are not broken. Also, check the anchor bolts to ensure none are loose. A loose fit or broken spring might cause excessive wear and improper barrier operation.



PIVOT TUBE END



FRONT END

12. Check Chain Bolts. If these connections are not kept tight, it might cause loose motion that could result in excessive wear. Apply Liquid Wrench, Industrial Chain Lubricant with Moly, PL711 or equal.



13. Check Split Journal Bearing Bolts. Make sure these are tight. A loose fit might cause excessive wear and improper bollard operation.



14. Check Post Assembly and touch up paint as needed. Use Enamel paint, Zinc Yellow (Paint # RAL 1018) or equal. Information on the paint can be found at Orbittx.com
15. Check Chain and touch up paint as needed. Use Rustolium Zinc Rich Primer (Black) or equal.
16. Check the unit interior for dirt and debris. Remove as necessary.
17. Replace the Access Cover Plates and screws (Apply Permatex Anti-Seize Lubricant or equal to screws) and remove traffic safety cones.
18. Report any deficiencies to the on site supervisor, complete this checklist, & maintain a copy in files.
19. Return barrier to NORMAL Operations.

Attachment 2 – Support Post

A support post can be fabricated locally to assist during maintenance operations. RSSI uses this type of support post during the manufacturing process. The diagram below depicts the support post dimensions.

